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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,269	08/28/2003	Yan Zhou	10095/18	1981

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EXAMINER

CHIEM, DINH D

ART UNIT PAPER NUMBER

2883

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/652,269

Applicant(s)

ZHOU ET AL.

Examiner

Erin D. Chiem

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 5-9, 21, 37 and 43-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 10-20, 22-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group I and its species, and Group II in the reply filed on March 25, 2005 is acknowledged. The traversal is on the ground(s) that:

a) The Requirement for Restriction/Election has not provided an example of how the inventions are usable together such as what the single combination is or how it would function. This is not found persuasive because on page 3 of the Office Action, the Examiner clearly stated the distinctness of each invention. Furthermore, the two inventions can be usable together as a photonic signal delayer (US 5,751,466)

b) There is no prima facie finding in the Office action that the two subcombinations are usable together as a combination. The Examiner, respectfully, wishes to point out to the Applicant that the Examiner is not required to present a prima facie case of obviousness in a requirement for restriction/election.

c) Applicants can find no support for the uses offered for Group II in the claims or in the specification of the present application. This is found persuasive because Applicants' inability to find the uses offered for Group II in the present claims or specification of the present application is a clear indication that there are other uses for Group II and further support the restriction requirements.

d) Applicants find 4 separate species is not burdensome to examine; the Examiner find this argument is not persuasive.

The requirement is still deemed proper and is therefore made FINAL.

***Drawings***

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the poor resolution of the figures are not acceptable. For example, Fig. 1, 2b-8d has poor resolution that the details are not visible, especially Fig. 6, wherein the poor resolution renders the figure to be insignificant. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 10-20, 28-36, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamada (US 6,798,960 B2). Hamada teaches a light transmitting device having a graded index of refraction comprising a body made substantially of a first material, such as lithium niobate crystal, the body having embedded therein a plurality of discrete structures, such as Faraday columns (col. 6, line 38-40) or refractive particles (col. 13, line 4-7) wherein at least one dimension of the discrete structures is smaller than an effective wavelength of light in the second material, wherein the first material has a first index of refraction and the second material has a second index of refraction different from the first index of refraction by at least 0.5 (col.

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32, line 23-28), wherein the discrete structures may have alternating layers of various thickness of one-quarter-wavelength such that the alternating layers act as one-quarter-wavelength plate; a graded index of refraction. Hamada further teach one of the material comprises of silicon dioxide and the second material comprises of tantalum pentoxide or titanium dioxide or silicon (col. 32, line 23-26).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21-27 and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada in view of Soljacic et al (US 2003/0031443 A1).

7. Hamada teaches a light transmitting device having a graded index of refraction comprising a body made substantially of a first material, such as lithium niobate crystal, the body having embedded therein a plurality of discrete structures, such as Faraday columns (col. 6, line 38-40) or refractive particles (col. 13, line 4-7) wherein at least one dimension of the discrete structures is smaller than an effective wavelength of light in the second material, wherein the first material has a first index of refraction and the second material has a second index of refraction different from the first index of refraction by at least 0.5 (col. 32, line 23-28). However, Hamada does not teach converting mode size from a coupled optical fiber nor does Hamada teaches converting a small mode size of less than 1 micrometer.

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8. Soljacic et al. teach a photonic crystal fiber comprising of two different materials with high index contrast between the materials. The fiber waveguides taught by Soljacic et al. is capable of converting modes and having mode size wherein the small mode size is less than 1 micrometer [0222]. Due to the bidirectional of the Soljacic et al. waveguide, it is insignificant as to which end the optical signal is coupled to the photonic waveguide.

9. Since Hamada and Soljacic et al. are from the same field of endeavor, the purpose disclosed by Soljacic et al. would have been recognized in the pertinent art of Hamada.

10. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide various sizing regions within the waveguides such that the mode field may expand or contract for the coupling purpose since the concept of utilizing photonic bandgap crystal and high index-contrast materials are the same. The motivation for providing a mean to couple different mode sizes is so that various optical devices such as a detector or transmitter may be coupled to the optical device as taught by Hamada.

### *Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Erin D Chiem  
Examiner  
Art Unit 2883



Sung Pak  
Patent Examiner  
AU 2874